



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR       | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------------|---------------------|------------------|
| 09/778,996      | 02/07/2001  | Konstantinos I. Papathomas | END920000065US1     | 8725             |

7590 12/16/2003  
Jack Friedman  
Schmelser, Olsen & Watts  
3 Lear Jet Lane  
Suite 201  
Latham, NY 12110

EXAMINER

KEEHAN, CHRISTOPHER M

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

1712

DATE MAILED: 12/16/2003

13

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/778,996

Applicant(s)

PAPATHOMAS, KONSTANTINOS  
I.

Examiner

Christopher M. Keehan

Art Unit

1712

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 November 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,5,6,8,14,18-29,31,37,39,41,43,44 and 46-50 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,5,6,8,14,18-29,31,37,39,41,43,44 and 46-50 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All   b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

### **DETAILED ACTION**

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

**Note: as mentioned in the previous office action, on page 3, lines 22-25 of the Specification, Applicant appears to be referring to the wrong patent.**

### ***Claim Objections***

Claim 39 is objected to because of the following informalities: claim 39 appears to be a dependent claim, but has no dependency. Appropriate correction is required.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1, 5, 6, 8, 14, 18-29, 31, 37, 39, 41 and 43 rejected under 35 U.S.C. 102(b), and claims 13 and 14 under 35 U.S.C. 103(a) as being unpatentable over Christie et al. have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments with respect to claims 1-5, 6, 8, 18-20, 23, 25-29, 31, and 39 are rejected under 35 U.S.C. 102(b) as being anticipated by Arldt et al. (5,766,670) and claim 41 as being unpatentable over Arldt et al. have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments with respect to claims 1-5, 6, and 8 are rejected under 35 U.S.C. 102(a) as being anticipated by Day et al. (6,444,407 B1) have been considered but are moot in view of the new ground(s) of rejection.

***Claim Rejections - 35 USC § 103***

Claims 1, 5, 6, 14, 18-29, 31, 37, 39, 41, 43, and 48-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christie et al. (5,668,059). Regarding Claims 1, 5, and 6, Christie et al. disclose an encapsulant composition comprising a resin material selected from the group consisting of epoxy and cyanate ester resins, wherein the resin material is a cycloaliphatic epoxide, derived from unsaturated aromatic hydrocarbon compounds, comprising glycidyl ethers, wherein the resin material is at least a dicyanate ester, and wherein the resin material comprises about 20 percent to about 55 percent by weight of the composition (col.3, line 20-col.9, line 46), a flexibilizing agent (col.11, lines 14-33), and a filler material comprising substantially spheroidal particles, each having a diameter of less than about 41 microns (col.9, line 46-col.10, line 10). It is the examiner's position that the particles of Christie et al. are substantially spheroidal or spherical, as applicant has not defined substantially, and therefore the term substantially has been treated on the merits according to the MPEP, section 2173.05(b). Further, they are the same filler as applicant's. Christie et al. do not appear to disclose an amount of flexibilizer as instantly claimed. Christie et al. do disclose that the flexibilizer is added in small amounts to impart desirable mechanical

Art Unit: 1712

properties to the composition, thereby identifying the flexibilizer as a result-effective variable. Therefore, as applicant has shown no criticality as to the instantly claimed range in the specification or experimental results, and the value of flexibilizer in Christie et al. is from 0.56% to about 1.6% by weight (as set forth in the previous office action), it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added an amount of flexibilizer included in the amount as instantly claimed through routine experimentation and optimization. A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Boesch*, 205 USPQ 215. It has been held that where the general conditions are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller*, 105 USPQ 233, 235. Further, as applicant has included the value of 2% by weight (bw) in the instantly claimed range, it appears that two is close enough to the 1.6% bw of Christie et al. to have the same effect on the composition. A prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. v. Banner*, cited in MPEP 2144.05.

Regarding claims 14 and 37, Christie et al. disclose a coupling agent as claimed (col.9, line 56-col.10, line 8).

Regarding claim 18, the same reasoning as set forth above for claim 1 also applies to claim 18, as the claimed subject matter is essentially the same. Christie et al. disclose an electronic package as instantly claimed (Figure).

Regarding Claims 19-24, Christie et al. disclose the substrate as instantly claimed (col.12, line 12-col.14, line 45).

Regarding Claims 25-29, Christie et al. disclose an encapsulant composition comprising a resin material selected from the group consisting of epoxy and cyanate ester resins, wherein the resin material is a cycloaliphatic epoxide, derived from unsaturated aromatic hydrocarbon compounds, comprising glycidyl ethers, wherein the resin material is at least a dicyanate ester, (col.3, line 20-col.9, line 46).

Regarding claim 31, Christie et al. disclose Christie et al. disclose a flexibilizing agent selected from the group as instantly claimed (col.11, lines 14-33).

Regarding claim 39, Christie et al. disclose a catalyst selected from the group as instantly claimed (col.10, lines 41-59).

Regarding claim 41, Christie et al. do not appear to specifically disclose the instantly claimed method steps. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the flexibilizer to the resin at an elevated temperature in a separate step because the flexibilizer acts to make the resin composition more resilient, and if not mixed with the resin and melted into the composition, then it does not have the desired flexibilizing effect on the composition.

Regarding claim 43, Christie et al. disclose the step being performed under vacuum (col.11, lines 57-67).

Regarding claims 48-50, Christie et al. disclose a diameter of up to about 31 microns (col.9, lines 47-56). Although Christie et al. do not appear to disclose a diameter exceeding 31 microns as claimed by applicant, because applicant has shown no criticality as to the instantly claimed diameter in the specification or through experimental results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to expect the composition of Christie et al. to have the same properties as the filler diameter of Christie et al. is at most 31 microns, which encompasses applicant's necessary range of more than 31 to less than about 41 microns, absent evidence to the contrary. A prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. v. Banner*, cited in MPEP 2144.05.

Claims 1, 5, 6, 8, 18-20, 23, 25-29, 31, 39, 41, 44, and 46-50 are rejected under 35 U.S.C. 103(a) as being unpatentable by Arldt et al. (5,766,670). Regarding Claims 1, 5, and 6, Arldt et al. disclose a composition comprising a resin material selected from the group consisting of epoxy and cyanate ester resins, wherein the resin material is an epoxy resin and comprises glycidyl ethers (col.4, line 1-col.5, line 23 and col.6, line 54-col.8, line 31), wherein the resin material is at least a dicyanate ester (col.10, line 65-

Art Unit: 1712

col.12, line 46), a flexibilizing agent (col.9, line 46-col.10, line 10), and a filler (material comprising substantially spheroidal particles, each having a diameter of less than about 41 microns col.3, lines 1-32). It is the examiner's position that the particles of Arldt et al. are substantially spheroidal or spherical, as applicant has not defined substantially, and therefore the term substantially has been treated on the merits according to the MPEP, section 2173.05(b). Further, they are the same filler as applicant's. Arldt et al. do not appear to disclose an amount of flexibilizer as instantly claimed. Arldt et al. do disclose that the flexibilizer is added to impart flexibility and thermal shock resistance to the composition, thereby identifying the flexibilizer as a result-effective variable.

Therefore, as applicant has shown no criticality as to the instantly claimed range in the specification or experimental results, and the value of flexibilizer in Arldt et al. is preferably from 2% to about 5% by weight, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added an amount of flexibilizer included in the amount as instantly claimed through routine experimentation and optimization. A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Boesch*, 205 USPQ 215. It has been held that where the general conditions are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller*, 105 USPQ 233, 235. Further, as applicant has included the value of about 5% bw in the instantly claimed range, it appears that two is close enough, if not included in, the about 5% bw



Art Unit: 1712

range of Arldt et al. to have the same effect on the composition. A prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. v. Banner*, cited in MPEP 2144.05.

Regarding claim 8, Arldt et al. disclose a flexibilizer as instantly claimed (col.9, line 63-col.10, line 35).

Regarding claim 18, the same reasoning as set forth above for claim 1 also applies to claim 18, as the claim limitations are essentially the same, except for the structural limitations in claim 18. Arldt et al. disclose a material positioned as instantly claimed (Figure 1).

Regarding claims 19, 20, and 23, Arldt et al. disclose the instantly claimed substrate (col.2, lines 59-67).

Regarding claims 25-29, Arldt et al. disclose the instantly claimed compounds (co.4, line 1-col.5, line 23, col.6, line 54-col.8, line 31, and col.10, line 65-col.12, line 46).

Regarding claim 31, Arldt et al. disclose the instantly claimed flexibilizer (col.9, line 63-col.10, line 35).

Regarding claim 39, Arldt et al. disclose a catalyst as instantly claimed (col.6, lines 5-53).

Regarding claim 41, Arldt et al. do not appear to specifically disclose the instantly claimed method steps. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the flexibilizer to the resin at

Art Unit: 1712

an elevated temperature in a separate step because the flexibilizer acts to make the resin composition more resilient, and if not mixed with the resin and melted into the composition, then it does not have the desired flexibilizing effect on the composition.

Regarding claims 44, 46, and 47, Arldt et al. disclose a flexibilizer of thermoplastic material containing a thermoplastic oligomer backbone (col.9, line 53- col.10, line 36).

Regarding claims 48-50, Arldt et al. disclose a diameter of from 0.1 to 75 microns (which encompasses applicant's necessary range of more than 31 to less than about 41 microns), and preferably 0.5 to 25 microns (col.3, lines 18-23). Although Arldt et al. do not appear to preferably disclose a diameter exceeding 31 microns as claimed by applicant, because applicant has shown no criticality as to the instantly claimed diameter in the specification or through experimental results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to expect the composition of Arldt et al. to have the same properties in the composition as the filler diameter as instantly claimed, absent evidence to the contrary, because Arldt et al. disclose preferably at most 25 microns, and applicant discloses a range of more than 31 microns to less than about 41 microns,. A prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. v. Banner*, cited in MPEP 2144.05.

Claims 1, 5, 6, 8, 44, and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Day et al. (6,444,407 B1). Regarding claims 1, 5, 6, Day et al. disclose a composition comprising a resin material selected from the group consisting of epoxy and cyanate ester resins, wherein the resin material is an epoxy resin and comprises glycidyl ethers (col.3, line 23-col.4, line 20), wherein the resin material is at least a dicyanate ester (col.5, encompasses the instantly claimed range (col.6, line 44-col.7, line 22), and a substantially spheroidal or spherical filler (col.6, lines 35-39). Day et al. do not appear to specifically disclose a filler particle size as claimed. However, Day et al. do disclose applying the coating at thicknesses of 1 to about 30 microns, preferably from 9 to about 11 microns (col.6, lines 33-34). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for Day et al. to have contained filler particles in an amount included in the instantly claimed range because the filler size cannot be any larger than the coating thickness, and Day et al. disclose a maximum of 30 microns for a particle diameter.

Regarding claim 8, Day et al. disclose a flexibilizer as instantly claimed (col.6, line 44-col.7, line 22).

Regarding claim 44, Day et al. disclose a flexibilizer as claimed (col.6, line 44-col.7, line 19), which discloses the same flexibilizers as disclosed by applicant (pages 17-19 of the specification).

Regarding claim 48, Day et al. disclose a diameter of about 1 to about 30 microns, preferably about 9 to 11 microns (col.6, lines 33-34). Although Day et al. do not appear to specifically disclose a diameter exceeding 31 microns as claimed by

Art Unit: 1712

applicant, because applicant has shown no criticality as to the instantly claimed diameter in the specification or through experimental results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to expect the composition of Day et al. to have the same properties in the composition as the filler diameter as claimed, absent evidence to the contrary, because Day et al. disclose up to about 30 microns, and applicant discloses a range of more than 31 microns to less than about 41 microns. A prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. v. Banner*, cited in MPEP 2144.05.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 1712

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

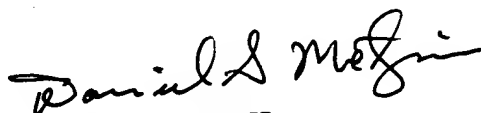
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Keehan whose telephone number is (703) 305-2778. The examiner can normally be reached on Monday-Friday, from 6:30 to 3:00.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Christopher Keehan

November 26, 2003

  
DANIEL S. METZMAIER  
PRIMARY EXAMINER  
ART UNIT 1712